Vectors

Notation	$\overrightarrow{AB} = B - A = (b_1 - a_1, b_2 - a_2)$	ex : $A(3,2)$ e $B(4,5)$ $\overrightarrow{AB} = (4,5) - (3,2) = (4-3, 5-2) = (1,3)$
Magnitude	$\left\|\overrightarrow{u}\right\| = \sqrt{(u_1)^2 + (u_2)^2}$	ex : $\overrightarrow{u}(3,2)$ $\left\|\overrightarrow{u}\right\| = \sqrt{3^2 + 2^2} \Leftrightarrow \left\|\overrightarrow{u}\right\| = \sqrt{13}$
Square of magnitude of a vector	$\left(\overrightarrow{u}\right)^2 = \left\|\overrightarrow{u}\right\|^2$	ex : $\overrightarrow{u}(4,3)$ e $\left\|\overrightarrow{u}\right\| = 5$ logo $\left(\overrightarrow{u}\right)^2 = 5^2$
	$A + \overrightarrow{u} = (a_1 + u_1, a_2 + u_2)$	ex : $A(4,5)$ e $\overrightarrow{u}(3,2)$ $A + \overrightarrow{u} = (4+3, 5+2) \Leftrightarrow A + \overrightarrow{u} = (7,7)$
	$\overrightarrow{u} + \overrightarrow{v} = (u_1 + v_1, u_2 + v_2)$	ex : $\overrightarrow{u}(6,3)$ e $\overrightarrow{u}(2,1)$ $\overrightarrow{u} + \overrightarrow{v} = (6+2, 3+1) \Leftrightarrow \overrightarrow{u} + \overrightarrow{v} = (8,4)$
Calculations	$k \times \overrightarrow{u} = (k \times u_1, k \times u_2)$	ex : $k = 2$ e $\overrightarrow{u}(3,4)$ $k \times \overrightarrow{u} = (2 \times 3, 2 \times 4) \Leftrightarrow k \times \overrightarrow{u} = (6,8)$
The Scalar or Dot Product	$\overrightarrow{u} . \overrightarrow{v} = u_1 \times v_1 + u_2 \times v_2$	ex : $\overrightarrow{u}(2,1)$ e $\overrightarrow{v}(0,3)$ $\overrightarrow{u} . \overrightarrow{v} = 2 \times 0 + 1 \times 3$ $\overrightarrow{u} . \overrightarrow{v} = 3$
	$\overrightarrow{u} . \overrightarrow{v} = \left\|\overrightarrow{u}\right\| \times \left\|\overrightarrow{v}\right\| \times \cos\left(\overrightarrow{u} \hat{} \overrightarrow{v}\right)$	
Angle between two lines	Direction vector of lines: $\overrightarrow{u}$ e $\overrightarrow{v}$ angle: α	$\cos\alpha = \dfrac{\left\|\overrightarrow{u} . \overrightarrow{v}\right\|}{\left\|\overrightarrow{u}\right\| \times \left\|\overrightarrow{v}\right\|}$

To use the above concepts in space, just add a third coordinate.